UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/577,758 | 04/28/2006 | Lisebeth Van Pieterson | NL031297US1 | 6966 |

24737 7590 10/01/2009

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

| EXAMINER | |
|---|---|
| VERDERAME, ANNA L | |
| ART UNIT | PAPER NUMBER |
| 1795 | |
| MAIL DATE | DELIVERY MODE |
| 10/01/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/577,758 | VAN PIETERSON ET AL. | |
| | Examiner | Art Unit | |
| | ANNA L. VERDERAME | 1795 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *27 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-4,7,8,11 and 13-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,8,11 and 13-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**10577758**

**DETAILED ACTION**

The response filed on 7/27/2009 has been carefully considered. A response is presented below.

***Claim Rejections - 35 USC § 112***

1. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites a recording composition $Ge_xSn_ySb_{1-x-y}$ which can contain nothing but these three elements. The amendment to claim 1 further recites that recording layer comprises Cu in an amount of up to 10%. This limitation makes the composition of the recording material indefinite because the composition $Ge_xSn_ySb_{1-x-y}$ does not allow for the addition of extra elements.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. 200310214857 in view of Sakaue et al. US 2002/10168587.

In example 15 an optical recording medium comprising an 80 nm thick

$(Zones)_{80}$-$(SiO_2)_{20}$ first auxiliary layer, a 18 nm Ge-Sn-Sb recording layer, a 17 nm $(ZnS)_{80}$-$(SiO_2)_{20}$ second auxiliary layer, a 3nm thick GeN fourth auxiliary layer, and a 150 nm Ag third auxiliary layer.

In example 15 a $(ZnS)_{80}$-$(SiO_2)_{20}$ upper dielectric layer1 second auxiliary layer is formed to have a thickness of 17 nm. This layer will have a ratio of $\lambda/d$ of 5.1*108 W $m^{-2}$ $K^{-2}$ . $\lambda$ for $(ZnS)_{80}$-$(SiO_2)_{20}$ can be found in applicant's specification.

The Ge-N layer was placed between the reflective layer and the $(ZnS)_{80}$-$(SiO_2)_{20}$ second auxiliary layer to prevent mutual diffusion of elements(0277). . It is the position of the examiner that the 3nm thick GeN layer acts as an anti-sulfuration layer between the sulfur containing upper protective layer and the Ag reflective layer.(heat sink layer)

With regard to the limitations of claims 2-3 and 13 , Horie et al. discloses materials for the protective layers (first and second auxiliary layers) and thicknesses for the upper protective layer(second auxiliary layer) at (0137-0138 and 0143). Use of SiN as the dielectric material for the protective layers is taught at (01 38). Nitrides of Hf ,Si, or Ge as materials to form the protective layer are taught at (0137) . Oxides of TA, In, or Sn are also taught at (0137). Horie et al. specifically discloses SiN(equivalent to $Si_3N_4$) as an alternative material for the protective layers. Also, Horie et al. discloses that

the upper protective layer can have a thickness of preferably at least 5 nm. This disclosure meets the limitation of claim 2 which requires a thickness of less than 10 nm. The upper protective layer of $(ZnS)_{80}(Si02)_{20}$ having a thickness in the range of 1-9 nm will meet the limitations recited in instant claims 1-2 and 13. Though Horie et al. may be silent in regard to setting a ratio between the heat conduction and the thickness of the upper protective layer, Horie et al. teaches materials and thicknesses for the upper protective layer that are identical to those taught by the applicant. A $(ZnS)_{80}$-$(Si0_2)_{20}$ having a thickness in the range of 1-9 nm will inherently posses the qualities recited in instant claim 1. As with the applicant's invention, the media of Horie et al. are capable of high speed recording.

With regard to the limitation of claim 4, the examiner points out that several examples shown in tables 4 and 5 disclose recording layers of 15 and 16 nm. A recording layer having a thickness of 15 nm touches the applicant's range of less than 15 nm. Further, the examiner notes that in section 0025 Horie et al. discloses a particularly preferable range for the recording layer of from at least 10 nm to at most 20nm. A recording layer having a thickness of at least 10 nm to at most 14 nm falls within the particularly preferable range disclosed by Horie et al. and also falls within the applicant's range as recited in claim 4.

With regard to the limitation of claims 5-6, in example 8 Horie et al. discloses a recording composition having 64% Sb, 16% Sn, 18% GeI and 2% Ag is taught. This recording composition falls within the applicant's recited range. Also, in example 11 Horie et al. discloses an optical recording medium comprising a 95 nm first protective layer of ZnS-$Si0_2$, an $(Sb_{.92}Sn_{.08})_{.77}Ge_{.15}In_{.08}$(70.84% Sb, 6 .16%Sn, 15% Ge, and 8% In) recording layer having a thickness of 18 nm, a second protective layer of ZnS-$SiO_2$ having a thickness of 27 nm, a GeN layer having a thickness of 3nm(fourth auxiliary layer) and an Ag reflective layer having a thickness of 200 nm(third auxiliary layer)(table 3). This recording composition falls outside the applicant's recited range but contains an additive of claim 5.

A general formula for the recording composition according to this invention is taught in the abstract. Benefits obtained by adding M are taught at (0058-0059).

It would have been obvious to one of ordinary skill in the art to modify the optical recording medium taught in example 11 of Horie et al. by using the phase-change composition of example 8 and forming the recording layer to have a thickness of from 10-14 nm as taught at (0125) with the reasonable expectation of forming a useful recording medium. Further, it would have been obvious to form the upper protective layer of ZnS-$Si0_2$ to have a thickness of from 1-9 nm based on the disclosure at (0143) and with a

reasonable expectation of success. Further still it would have been obvious to one of ordinary skill in the art to alternatively form the upper protective layer having a thickness of from 1-9 nm of Si-N based on the disclosure at (01 38) which establishes ZnS-$Si0_2$ and Si-N as equivalent alternatives and with the reasonable expectation of success.

The examiner notes that the example where the upper protective layer is an SiN layer formed to a thickness in the range of 9 nm will be indistinguishable from an example wherein an SIN upper protective layer(second auxiliary layer) having a thickness of 8, nm and a I nm SiN fourth auxiliary layer are formed(emphasis added).

Horie et al. does not explicitly disclose forming a separate fourth auxiliary layer of $Si_3N_4$ where the fourth auxiliary layer screens the third auxiliary layer from the chemical influence of the second auxiliary layer. The Ge-N interface layer of Horie et al. also do not have a thickness of less than 3 nm as recited in instant claim 11.

Sakaue et al. discloses a recognized problem wherein Ag in the reflective layer or in the recording layer reacts with sulfur atoms in for example a ZnS-$SiO_2$ layer leading to a phenomenon similar to corrosion(0012, 0037). Provision of a non-sulfur containing protective layer or

provision of a non-sulfur containing interface layer is shown to prevent corrosion of the Ag reflective layer(table 1 and elsewhere). An interface film having a thickness of at least 1 nm is shown to prevent corrosion (tab1e 5). Similar results to the case where the interface layer is Ge-N were observed when a nitride of silicon is used (0102-0103).

It would have been obvious to one of ordinary skill in the art to modify embodiment rendered obvious above wherein the medium of example 15 of Horie et al. has an upper protective layer having a thickness in the range of 1-9 nm by forming the Ge-N layer to have a thickness of at least 1 nm with the reasonable expectation of preventing a reaction between the sulfur atoms in the upper protective layer(second auxiliary layer) and the Ag third auxiliary based on the evidence provided in table 5 in Sakaue et al. Further, it would have been obvious to alternately form the interface layer(fourth auxiliary layer) of $Si_3N_4$ based on the disclosure in Sakaue et al. that $Si_3N_4$ also prevents a reaction from occurring between the sulfur atoms in the upper protective layer(second auxiliary layer) and the Ag third auxiliary.

Horie et al. does not specifically disclose a further substrate having a thickness of 0.6 or 0.1 mm. Horie et al. does disclose that the instant invention is applicable to CD-type and DVD-type optical recording media(0004). The medium of Horie et al. is also a top-side read optical disc.

This means the medium is read through the side opposite the supporting substrate as illustrated in figure I(b) of Horie et al. Applicant also discloses only a top-side read medium. It is the position of the examiner that provision of a substrate or further protective layer, usually made of plastic, on the medium of figures 1 (a), 1 (b) would be obvious. This assertion is based on the fact that commercially available optical recording media do not have an exposed reflective layer or dielectric material as would be the case in examples I (a) or I (b) and based on the positive result, of protecting the disc from damage, which is obtained by providing a protective layer. it is the position of the examiner that Horie et al. intends for the provision of a further substrate/light-transmitting layer/protective layer covering the reflective layer in 1(a) and the dielectric protective layer in I(b). When the protective layer is provided on a top-read disc like that shown in figure I(b) it is commonly referred to as a light-transmitting , light-transmission, or light-transmissive film.

It is further the position of the examiner that thicknesses of 0.6mm and 0.1 mm are standard for DVD-type and Blue-Ray-type discs respectively.

The limitation that cu is contained in the amount of up to 10% includes recording compositions containing from 0-10% Copper(emphasis added).

***Response to Arguments***

4. Applicant has argued that none of the applied references teach a recording composition $Ge_xSn_ySb_{1-x-y}$ where Cu is contained in amount of up to 10%. The examiner has pointed out that this makes the composition of the recording layer indefinite because the formula $Ge_xSn_ySb_{1-x-y}$ does not allow for the addition of other elements. Also, the limitation that copper is contained in an amount up to 10% includes compositions containing 0-10% copper.

***Conclusion***

***5.*** **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone

number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795